THE

HOME FRIEND;

A WEEKLY MISCELLANY OF AMUSEMENT AND INSTRUCTION.

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NINEVEH.—WAR.

NIMROUD CHARIOT.

"Is this the man that made the earth to tremble, that did shake kingdoms; that made the world as a wilderness, and destroyed the cities thereof; that opened not the house of his prisoners?" (Isa. xiv. 16, 17.)

OF the truth of the portrait which Scripture draws of the Assyrian monarchy, the monuments now in course of exhumation afford striking confirmation. The prominent place given to scenes of battle, carnage, conquest, and spoil, in the sculptured and pictured embellishments of the royal palaces, show how large a part martial exploits had in the ambition of the

king, and how much war was considered as his proper occupation. In these scenes he is depicted as taking his eager part in all the varieties of warfare that the age was acquainted with, or the genius of the artist could supply; now going forth with his armed bands and chariot-warriors, now pouring forth the winged shafts from his mighty bow as he stands in his advancing car: now, regardless of fatigue, he descends from his chariot, and mingles in the thick of the fight on foot; now he besieges a walled city, shoots his arrows against its battlements, and brings up his powerful rams and engines against its walls; now he fords rivers, scales mountains, penetrates forests in pursuit of his foes; now he reviews his captives led away in bonds, returns in triumphal procession at the head of his victorious captains and military eunuchs, or receives in his palace the treasure and spoil of various kinds that his successful enterprises have produced. These were the favourite subjects of palatial art in those days; in the contemplation of which the royal conqueror was never tired; they were the records of national and personal glory, in the splendour of which he desired his name to be emblazoned in the eyes of posterity.

When the numerous cuneiform inscriptions which exist on the monuments, —the true records of Assyrian history, to which the bas-reliefs bear about the same relation as the pictorial illustrations of our modern works bear to the letter-press,—are translated and published in an European language, we shall doubtless acquire a far more accurate acquaintance with the subjects treated of in this volume than we can possibly obtain at present by the aid of the sculptures alone. This achievement the literary world may hope to see acomplished at no distant day, thanks to the learning, the perseverance, and skill of such men as Colonel Rawlinson, Dr. Hincks, Professor Grotefend, and other labourers in this inviting but arduous field. Meanwhile the version of the famous inscription on the Black Obelisk, published by Colonel Rawlinson, affords us a specimen of the events of an Assyrian monarch's reign, as registered by himself on a public monument intended to perpetuate his glory. We see here how truly WAR was *the business of his life*.

The king, Temen-bar II., whose conquests are thus recorded, was the builder of the central palace at Nimroud, and the son of Sardanapalus (Assaradan-pal), who built, or at least inhabited and adorned, the north-west palace of the same mound, the oldest monument of Assyrian art yet discovered. A remote antiquity must therefore be assigned to his reign, though its exact chronology cannot yet be fixed.* The reign of Temen-bar was long, and each of the thirty-one years through which it was protracted, witnessed a campaign of conquest and spoliation against some one or more of the surrounding nations. Many of these expeditions were against tribes already subjugated, but rising in rebellion against the iron yoke of the conqueror; and we see that the empire of Assyria at the time of this record extended to the Mediterranean, to the Caspian, and to the Persian Gulf. The greater part of these expeditions the monarch conducted in person; but towards the latter portion of his reign his advancing age probably diminished his activity, for the conduct of his wars was then generally entrusted to his faithful veteran commander Detarasar, the partner of his exploits, and the sharer of his fame throughout his lengthend reign.

The whole of this register, though of great geographical and historical

* There is evidence that it was contemporary with that of Jehu king of Israel.

interest, is too long for our pages; but we transcribe the events of the first ten years, from Colonel Rawlinson's valuable lections.

After a lengthened invocation of his idol gods, the enumeration of his titles, and the specification of his genealogy, Temen-bar says:—"At the commencement of my reign, after that I was established on the throne, I assembled the chiefs of my people and came down into the plains of Esmes, where I took the city of Haridu, the chief city belonging to Nakharni.

"In the first year of my reign, I crossed the Upper Euphrates, and ascended to the tribes who worshipped the god Husi. My servants erected altars (or tablets) in that land to my gods. Then I went on to the land of Khamána, where I founded palaces, cities, and temples. I went on to the land of Málar, and there I established the worship (or laws) of my kingdom.

"In the second year, I went up to the city of Tel Barasba, and occupied the cities of Ahuni, son of Hateni. I shut him up in his city; I then crossed the Euphrates, and occupied the cities of Dabagu and Abarta belonging to the Sheta, together with the cities which were dependent on them.

"In the third year, Ahuni, son of Hateni, rebelled against me, and having become independent, established his seat of government in the city of Tel Barasba. The country beyond the Euphrates he placed under the protection of the god Assarac, the Excellent, while he committed to the god Rimmon, the country between the Euphrates and the Arteri, with its city of Bither, which was held by the Sheta. Then I descended into the plains of Elets. The countries of Elets, Shakni, Dayini, Enem (?), Arzaskán, the capital city of Arama, king of Ararat, Lazan and Hubiska, I committed to the charge of Detarasar. Then I went out from the city of Nineveh, and crossed the Euphrates, I attacked and defeated Ahuni, the son of Hateni, in the city of Sitrat, which was situated upon the Euphrates and which Ahuni, had made one of his capitals. The rest of the country I brought under subjection; and Ahuni, the son of Hateni, with his gods and his chief priests, his horses, his sons and his daughters, and all his men of war, I brought away to my country of Assyria. Afterwards I passed through the country of Shelár (or Kelár), and came to the district of Zoba. I reached the cities belonging to Nikti, and took the city of Yedi, where Nikti dwelt. (A good deal of this part of the inscription I have been obliged to translate almost conjecturally, for on the Obelisk the confusion is quite bewildering; the engraver having, as I think, omitted a line of the text which he was copying, aud the events of the third and fourth year being thus mingled together: while in the Bull Inscription, where the date is preserved, showing that the final action with Ahuni took place in the fourth, and not in the third year, the text is too much mutilated to admit of our obtaining any connected sense. I pass on accordingly to the fifth year.)

"In the fifth year, I went up to the country of Abyari; I took eleven great cities; I besieged Akitta of Erri in his city, and received his tribute.

"In the sixth year, I went out from the city of Nineveh, and proceeded to the country situated on the river Belek. The ruler of the country having resisted my authority, I displaced him, and appointed Tsimba to be lord of the district; and I there established the Assyrian sway. I went out from the land on the river Belek, and came to the cities of Tel-Aták (?) and Habaremya. Then I crossed the Upper Euphrates and received

tribute from the kings of the Sheta. Afterwards I went out from the land of the Sheta and came to the city of Umen (?) In the city of Umen (?) I raised altars to the great gods. From the city of Umen I went out and came to the city of Barbara. Then Hem-ithra of the country of Atesh, and Arhulena of Hamath, and the kings of the Sheta, and the tribes which were in alliance with them, arose: setting their forces in battle array they came against me. By the grace of Assarac, the great and powerful god, I fought with them and defeated them; 20,500 of their men I slew in battle, or carried into slavery. Their leaders, their captains, and their men of war, I put in chains.

"In the seventh year I proceeded to the country belonging to Khabni of Tel-ati. The city of Tel-ati, which was his chief place, and the towns which were dependent on it, I captured and gave up to pillage. I went out from the city of Tel-ati and came to the land watered by the head-streams which form the Tigris. The priests of Assarac in that land raised altars to the immortal gods. I appointed priests to reside in the land to pay adoration to Assarac, the great and powerful god, and to preside over the national worship. The cities of this region which did not acknowledge the god Assarac I brought under subjection, and I here received the tribute of the country of Nahiri.

"In the eighth year, against Sut-Baba, king of Taha-Dunis, appeared Sut-Bel-herat and his followers. The latter led his forces against Sut-Baba and took from him the cities of the land of Beth Takara.

"In the ninth year, a second time I went up to Armenia and took the city of Lunanta. By the assistance of Assarac and Sut, I obtained possession of the person of Sut-Bel-herat. In the city of Umen I put him in chains. Afterwards Sut-Bel-herat, together with his chief followers, I condemned to slavery. Then I went down to Shinar, and in the cities of Shinar of Borsippa, and of Ketika, I erected altars and founded temples to the great gods. Then I went down to the land of the Chaldees, and I occupied the cities, and I marched on as far even as the tribes who dwelt on the sea-coast. Afterwards in the city of Shinar, I received the tribute of the kings of the Chaldees, Hateni, the son of Dákri, and Baga-Sut, the son of Hukni, gold, silver, gems, and pearls.

"In the tenth year, for the eighth time I crossed the Euphrates. I took the cities belonging to Aralura of the town of Shalumas, and gave them up to pillage. Then I went out from the cities of Shalumas, and I proceeded to the country belonging to Arama (who was king of Ararat). I took the city of Arnia, which was the capital of the country, and I gave up to pillage one hundred of the dependent towns. I slew the wicked, and I carried off the treasures."

The number of troops which the Assyrian monarchs were accustomed to bring into the field would of course vary at different periods. We get a notion of it by Temen-bar's expressions in the record of the fourteenth year's campaign. "*I raised the country*, and assembled *a great army*; with 120,000 warriors, I crossed the Euphrates."

At a much later era the army of Sennacherib, which was totally destroyed in the neighbourhood of Jerusalem by the immediate power of God, consisted of 185,000 men. And the forces placed by Nabuchodonosor under the command of Holofernes, for the subjugation of Syria and Palestine, amounted to 120,000 foot and 12,000 horse (Judith ii. 5, 15); but the infantry was augmented at the siege of Bethulia, to 170,000, doubtless by levies from the conquered provinces (vii. 2).

XUM

There is no doubt that in so great an empire, founded and established by martial enterprise, in the midst of and over warlike nations, military discipline and tactics were well studied and carried to a high pitch of excellence. Of this, however, we can learn little from the sculptures, nor do the inscriptions yet read throw much light on it. The record of Temen-bar repeatedly alludes to three ranks of soldiers, "the leaders and captains, and men of war," or as it is elsewhere expressed, "superior officers, captains, and fighting men," besides the commander-in-chief. The proportion of the officers to the ranks is interesting; 460 superior officers, 1,121 captains, and 13,000 fighting men are enumerated.

Nothing like an array of battle, or order of march, appears in the more ancient sculptures; with the exception of the curious association of the soldiery in pairs, the one offensive the other defensive, the warriors are seen scattered promiscuously over the field, each apparently choosing his own station and mode of fighting. Probably, however, this is to be attributed to the taste of the artist, who doubtless wished to give as much of variety and of interest to the scene as he could.

In the later eras disciplined troops are clearly represented, and we trace something like a regular order of battle. Thus at Khorsabad the front rank is composed of archers alone, evidently mercenaries or allies (their caps, pointed beards, and short coats, distinguishing them from the Assyrian troops); then follows a troop of archers, each protected by his targeteer; behind these are stationed warriors armed with the spear and round buckler: and these are succeeded by a rank of archers shielded by round buckler bearers. All the native troops in this scene are heavy-armed.

Sometimes the arrangement is different. The front rank is composed of spearmen with round bucklers, the second of archers who kneel on one knee to shoot, and the third of archers erect, who are thus able to aim over the heads of their fellows.

The same sort of arrangement is shown in the Kouyunjik bas-reliefs, where also long lines of troops are represented in march. Cavalry appears here in large bodies for the first time, galloping in regular order over broad roads cut through mountain-forests. Ranks of infantry are also introduced, one of which consists of men armed with the spear alone, another of men wielding nothing but the mace; and again, another rank armed with the spear and round shield.

HOME REFORM—(*continued*).

The necessity for the admission of fresh air into all apartments occupied by human beings, and the importance of providing for the escape of bad or vitiated air, will be evident from the fact that every person during each minute vitiates a considerable volume of air, that is, renders it unfit to do the very work which breathing is designed to do in the wonderful machinery of animal life.

Every one must have remarked the copious *exhalation* of moisture which takes place in breathing, and which presents a striking resemblance to the exhalation from the surface of the skin. In the former, as in the latter instance, the exhalation is carried on by the innumerable minute capillary vessels in which the small arterial branches terminate in the air-cells. Breathing from the lungs is, in fact, one of the chief outlets of waste matter from the system; and the air which we breathe is thus vitiated, not only by

the subtraction of its oxygen, and the addition of carbonic acid, but also by animal effluvia, with which it is loaded when returned from the lungs. In some individuals, this last source of impurity is so powerful as to render their vicinity offensive and even insupportable to the bystanders, and it is its presence which gives the disagreeable, sickening smell to crowded rooms.

Absorption, in like manner, takes place from the lining membrane of the lungs, as we have seen it do in the skin. When a person breathes an atmosphere loaded with fumes of spirits, or of tobacco, a portion of the fumes is taken up by the absorbing vessels of the lungs, and carried into the system, and there produces precisely the same effects as if introduced into the stomach: animals, for example, have been killed by being made to inhale the fumes of prussic acid for a few minutes. The lungs thus become a ready inlet to contagion, and other poisonous influences, diffused through the air which we breathe.

It is an essential condition of healthy respiration that a regular supply of pure fresh air be provided, without which the requisite changes in the constitution of the blood, as it passes through the lungs, cannot be effected. In order that you may understand and appreciate this important condition, some explanatory remarks on the nature of the changes alluded to will be necessary.

Atmospheric air consists of about seventy-eight per cent. of nitrogen or azotic gas, twenty-one per cent. of oxygen, and not quite one per cent. of carbonic acid or fixed air; and such is its constitution when taken into the lungs in the act of breathing. When it is expelled from them, however, its composition is found to be greatly altered. The quantity of nitrogen remains nearly the same, but eight or eight-and-half per cent. of the oxygen, or vital air, have disappeared, and been replaced by an equal amount of carbonic acid. In addition to these changes, the expired air is loaded with moisture. Simultaneously with these occurrences, the blood collected from the veins, which enters the lungs of a dark colour and unfit for the support of life, assumes a florid red hue, and acquires the power of supporting life.

From oxygen being thus essential to life and respiration it is often called vital air, in contradistinction to those gases which are incapable of supporting life.

From these considerations, the importance of a due supply of fresh air wherever living beings are congregated must be obvious. It has been calculated that a man under ordinary circumstances consumes about 45,000 cubic inches of oxygen, and gives out about 40,000 cubic inches of carbonic acid, in twenty-four hours.

The fatal effects of breathing highly-vitiated air may easily be made the subject of experiment. When a mouse is confined in a large and tight glass jar full of air, it seems for a short time to experience no inconvenience, but in proportion as the consumption of oxygen and the exhalation of carbonic acid proceeds, it begins to show symptoms of uneasiness, and to pant in its breathing, as if struggling for air; and in a few hours it dies, convulsed, exactly as if drowned or strangulated. The same results follow the deprivation or vitiation of air in man and in all animated beings.

Numerous instances might be adduced of the fatal effects resulting from the crowding together in one apartment a greater number of human beings than the air contained in it would sustain, and from the absence of all regard to scientific rules in effecting ventilation. All must remember the sad story of the Black Hole at Calcutta.

XUM

In dwelling-houses lighted by gas, the frequent renewal of the air acquires increased importance. A single gas-burner will consume more oxygen, and produce more carbonic acid to deteriorate the atmosphere of a room than six or eight candles. If, therefore, where several burners are used, no provision be made for the escape of the corrupted air, and for the introduction of pure air from without, the health will necessarily suffer. Professor Faraday's arrangement for carrying off the air thus vitiated is very effectual, and its application may be learned at 110, Wardour-street.

The necessity for ventilation is not confined to rooms occupied in the day, but is of equal, if not greater, importance in sleeping apartments, which, of the two, are generally by far the most unwholesome. If the windows be opened for a short period in the morning, this is usually deemed sufficient, but no provision is made for the admission of pure air during the night, although on this mainly depends the restorative and refreshing effect of sleep. Curtains, and whatever tends to exclude a free circulation of pure air, ought to be avoided, and great care should be taken to change the bed clothes frequently, and to expose them to a draught through the day, in order to carry off the impurities with which they are saturated during the night. Small bed-rooms should be as little encumbered with furniture as possible, and the habit of stowing lumber under the bed be entirely abandoned.

The want of a free circulation of air greatly aggravates the evil which, in many dwellings, results from damp walls and floors. In the construction of new buildings it is easy to provide for these two most essential requisites of a healthy home—viz., that it should be dry and well ventilated; and if the working classes would, as far as may be in their power, practically manifest a sense of their importance, the same beneficial results might follow, which are already seen in London, where landlords begin to find that since improved accommodation has been provided in the Model Houses, tenants will not so easily submit to the defective and uncomfortable dwellings hitherto provided for them.

Those who have investigated the subject on scientific principles, show that in a dwelling-house each person ought to be allowed from 240 to 300 cubic feet of air to breathe per hour, or from four to five cubic feet per minute, and that by a continued movement it should be changed within that period. In a hospital the allowance must be considerably greater; inattention in such buildings to this all-important provision has in past years too often aggravated disease, and caused a great destruction of human life.

Ventilation may be described as of two kinds, natural, and mechanical or artificial. Doors and windows, with the crevices round them, chimneys and fire-places, conduce to the former; fans, pumps, screws, and other contrivances are employed to produce the latter.

Whenever a fire is lighted, the air in the lower part of the room is immediately set in motion, and a current begins to flow from the door and window, or any other opening, to the chimney, whereby much of the air which has become vitiated is carried off. This process of ventilation, in some slight degree, takes place when there is no fire in the chimney, and therefore bedrooms are much more healthy with a chimney than without one.

In giving some *practical directions* for ventilation, it may be remarked that improvements easily adopted in new are not always applicable to old buildings; but the general principles should be carried out as far as circumstances will admit, under the deep conviction of the absolute

necessity of pure air for the sustenance of a healthy state both of body and of mind.

In existing buildings, the ventilation of any living apartment may be generally much improved, without any sensible draught, by the introduction of an air-brick externally, and an iron frame internally, to which a sheet of perforated zinc is attached, and an iron plate hung to close it with a fall-down rack. In small rooms with a fire-place, the change of air thus caused, in addition to that from the door and window before described, is generally found sufficient to keep it in a healthy state.

In every room an opening for the escape of vitiated air ought to be made near the ceiling, especially in small bedrooms without fire-places. In some cases this may be effectively done by carrying up a pipe through the roof, bent at the top; in other cases an opening may be made over the door, with a piece of perforated zinc fitted in it. In some situations perforated or ventilating glass may be used with advantage, always remembering that where openings can be formed on the opposite sides of rooms, the air will be most speedily and effectually changed.

OUR NATIVE SONGSTERS.

THE BLACKBIRD.

Who has not paused in his ramble through the woods on some bright warm spring day, to listen to the mellow notes of the blackbird? (*Turdus merula.*) Perchance we have taken shelter beneath the boughs on which the delicate green leaves are daily becoming larger and more numerous, from the shower which alternates with the sunshine, and then as the gleams of the sun come forth again to render that foliage of brightest emerald hue, the blackbird sings its welcome in the sweetest strains. An April day suits it well, for it revels in the slight moisture which passing showers communicate to the atmosphere. The song is little varied, but so mellow, so flute-like are its tones, that few who are used to the country have failed to listen with delight. It is one of the earliest songs of spring, too, and beginning on some fine day of February, it fails not all the summer through, save at the period of moulting. We cannot, while the blackbird is singing,

see its jetty plumes, for it chooses for its place of song the thickest and most leafy part of the woodland. Could we have entered that wood when the morning sun was gradually gilding each leaf and bud with its earliest rays, we should have heard the loud greeting of the blackbird, like a psalm of thankfulness, for renewed sunshine.

At evening too, just when the shadows of the trees are lengthening on the ground, and all the landscape is assuming the faint grey tints of twilight, that blackbird's evening chaunt may tell to us the praises of its Maker. An approaching footstep disturbs the bird, and the sharp shrill cry which is then uttered, may be the sound of sorrow or of anger. The bird is, when wild, more subtle and distrustful than the song-thrush, and yet it can be tamed more easily when in captivity. Its powers of song render it a favourite cage bird, but its notes are never so sweet as in the green haunts which it loves so well, for they are too loud for a room, and are sometimes a sad annoyance in a neighbourhood where early rising is not practised, and when the glad morning song arouses the sleeper. But the pet blackbird may be taught to whistle many a little air, and is so good a mimic, that it can not only learn the notes of other birds, but is said by Dr. Latham to imitate the human voice. It has also been known to cry like a cock, and cackle like a hen, apparently enjoying the sound of the responses made by the fowls of the neighbouring farmyards.

We need not describe the bird so well known by its dark plumes, more black than even those of the raven, and its yellow bill, and yellow streaks around the eyes. The female bird, however, differs in colour, and the black plumage has a brownish hue, which on the chest passes into brown. White birds of this species are to be met with, and a naturalist who found one, to avoid the anomaly, calls it a white yellow bill.

The blackbird is, during winter, mostly a solitary bird, living in woods, hedges, and thickets; nor does it appear that we have many accessions of these birds from the north. It makes its nest in March or April, in large gardens, or thick hedges, or bushes of evergreen, frequently taking advantage of the dark green ivy, which, at this cold season, offers a secure covert from wind and rain; and which, during the early spring, has afforded in its dark berries, so good a supply of food. The nest is composed externally of fibres, moss, and small twigs; while a thick coating of mud forms an inner wall, which is well lined with fine grass. The eggs, which are four or five in number, are of a dull-bluish green, with darker blotches. Bishop Mant describes this structure, as placed,

> "The overarching boughs between
> Of some selected evergreen,
> Of laurel thick, or branching fir,
> Or bed of pleasant lavender,
> To lodge secure their pendent home
> A well-wove frame, with moisten'd loam
> Within cemented; and without
> Rough but compactly, all about
> With moss and fibrous roots entwined,
> And wither'd bent grass softly lined,
> Where may repose, in season due,
> Their pregnant balls of chalky blue,
> Besprent about the flatten'd crown
> With pallid spots of chestnut brown."

Snails and slugs, worms and insects, are the food of the blackbird, accompanied by a vegetable diet of grapes, cherries, currants, gooseberries, and

the berries of the ivy, the holly, and the mountain ash. It must be admitted that these birds sometimes commit great ravages in the fruits of the orchards and gardens, but they more than compensate for this by their services in destroying snails and insects. Every one accustomed to observe grass lands knows how terribly these are sometimes injured by the larva of the common cock-chafer; that insect which, in its perfected condition, often flies against us with its loud humming in our evening walks of May and June, and which is familiarly called the Oak-web. The grub of this insect remains for four years in a larva state, and will sometimes destroy the turf of whole acres of meadow land, feasting also upon the roots of corn, and when in great numbers, proving a sad pest to the agriculturist. Rooks are known to be great destroyers of this insect, following the ploughman in his course, and picking up the prey which the instrument may dislodge from the soil. Nor is the blackbird useless in ridding the land of cock-chafers. The Rev. W. T. Bree communicated a fact of this sort to the Magazine of Natural History, which forms a proof of their usefulness to man. "In the month of August last," says this gentleman, "I was struck with the rather unusually large assemblage of blackbirds which frequented my garden; eight or ten were frequently to be seen together; and one morning I counted thirteen at the same time, hopping about, and chattering on the grass plot before the house. Their visits were usually paid about eight o'clock in the morning, and continued to arrest my attention for perhaps ten days or a fortnight. The birds directed their operations more especially to particular spots on the grass plot, which they stacked up with their bills, till the turf, which changed colour, and was supposed to be dying, became almost bare in patches, and was quite disfigured by the refuse of grass, &c., which was left littered on the surface. Indeed, such was the rough and unsightly appearance which the grass plot presented in consequence, that hints were even thrown out that the blackbirds ought to be destroyed; for they had been repeatedly seen in the very act of disfiguring the turf, and the whole mischief was of course, from first to last attributed to them. Suspecting what might be the object of the birds' research, I turned up a piece of turf with the spade, and found it almost swarmed with the cockchafer grubs of various sizes; and this circumstance confirmed my suspicion, that it was for the purpose of feeding upon these larvæ, that the blackbirds had made such havoc of the grass plot. They performed, in short, in this case, precisely the same service in destroying the cockchafer grub, that the rooks are so well known to do. The turf, I should add, soon regained its wonted verdure, the injured patches being scarcely to be distinguished from the rest of the grass plot."

This writer adds that this fact confirms him in the opinion, that birds which chiefly subsist on vegetables, yet vary this diet with some portion of animal food; as at the very time when the blackbirds were so busy in devouring the grubs of the cockchafer, the garden was full of currants and gooseberries, which form so agreeable a meal to these birds.

Our blackbird is the *Merle* of our olden poets, and both this and the scientific name *Merula* are said to be derived from *mera*, or solitary, because the bird is not gregarious. The Scotch still call it the *Merle*. Thus Graham says,

> "List to the Merle's dulcet pipe! melodious bird,
> Who hid behind the milk-white hawthorn spray,
> Whose early flowers anticipate the leaf,
> Welcomes the time of buds, the infant years."

Shakspeare calls it—

"The Woosel-cock, so black of hue,
With orange-tawny bill."

And it is still called the garden ouzel in some counties. Woofel is another name by which the old English poets wrote of it, and which is apparently but a variation of Woosel. The Germans term the bird *Schwardrossel*.

The flesh of the blackbird is in some parts of the Continent considered a great delicacy during summer, though at the season in which it feeds on ivy berries it is somewhat bitter. In our country it is little eaten, and few of us would wish to share in the repast of which we read in the nursery, when

"Four-and-twenty blackbirds were placed in a pie."

WILD FLOWERS.

COMMON BRAMBLE, OR BLACKBERRY. (*Rubus fruticosus.*)

FEW are unacquainted with a plant whose fruits are so pleasing to the simple taste of childhood, and whose white flowers, sometimes tinged with pink, decorate every hedge during July and August. Elliott has said of it,

"Though woodbines flaunt and roses grow
O'er all the fragrant bowers,
Thou need'st not be ashamed to show
Thy satin-threaded flowers;
For dull the eye, the heart as dull,
That cannot feel how fair,
Amid all beauty, beautiful
Thy tender blossoms are."

This, as well as some others of the genus, is a biennial woody plant, producing suckers from the root, which ripen and bear leaves one year, and flowers and fruit the next. Pliny said that the propagation of trees by layers was taught the ancients by the bramble-bush. Knapp has observed of both this and the Dewberry (*Rubus cæsius*), that they may almost be considered as evergreens, and adds, that we have perhaps no other shrubby plant naturally deciduous except the Privet. These shrubs may be often seen with many green or purplish leaves on their boughs when all others, save the Ivy and the Holly, are stripped of their summer honours.

The ancients held the notion that both flower and fruit of the Bramble were efficacious against the bite of serpents; and that the young shoots, eaten as salad, served to fasten the loosened teeth, was an old fancy in our own country. The green twigs have been used for dyeing; the stems are employed for thatching cottages; and the fruits are preserved or eaten in puddings. In Sweden the berries of the Arctic Bramble (*Rubus Arcticus*), as well as those of the Cloudberry (*Rubus Chamæmorus*), are highly prized for various domestic uses. The berries of both these species are larger than our Blackberry. The Cloudberry is found on Alpine moors in this country, and has an agreeable flavour. It is much eaten both by the Laplanders and Norwegians. The Arctic Bramble is found in Scotland, but rarely. The genus is named from the Celtic word *Rub*, red, from the colour of some of the fruits. The common Raspberry is included in it, and is sometimes found wild in the north of our island. Gerarde called it *Raspis*, or Hindberry.

WILLIAM COWPER.

This charming poet was born the 15th of November 1731, at Great Berkhampstead, in Hertfordshire. His father, a Doctor of Divinity, was Rector of this place, and one of the Chaplains of George the Second. Both his parents were descended from noble and ancient families, his paternal grandfather being brother to William Earl Cowper, and his mother tracing back a relationship to the houses of Boleyn, Howard, and Mowbray, and through them to Henry the Third, King of England.

The simplicity of the times in Cowper's childhood assigned him his first instruction in the day-school of his native village. In one of his poems he thus alludes to the circumstance:—

"The gard'ner Robin, day by day,
Drew me to school along the public way,
Delighted with my bauble coach, and wrapt
In scarlet mantle warm and velvet capt."

At six years old he had the misfortune to lose his kind and amiable mother. The best account that can be given of his feelings on her death—by which melancholy event, child as he was, he appears to have been deeply affected—is his own:—

"I heard the bell toll'd on thy burial day,
I saw the hearse that bore thee slow away;
And turning from my nursery window drew
A long, long sigh, and wept a last adieu.
Thy maidens grieved themselves at my concern,
Oft gave me promise of a quick return;
What ardently I wish'd, I long believed;
And disappointed still, was still deceived;
By disappointment every day beguiled,
Dupe of *to-morrow* even from a child.
Thus many a sad to-morrow came and went,
Till, all my stock of infant sorrow spent,
I learn'd at last submission to my lot,
But though I less deplored thee, ne'er forgot."

On his mother's death he was placed under the care of Dr. Pitman, who resided a few miles from his home. With this gentleman he remained until he was eight years of age, when the appearance of specks on both his eyes alarmed his father, and the little boy was sent to a celebrated female oculist in London. He remained at her house two years, without deriving any benefit from her remedies; and at the expiration of that period he was sent to Westminster School. When he had been there a short time he caught the small-pox, which disorder, strange to relate, entirely removed the complaint in his eyes.

It does not appear what degree of proficiency in the rudiments of education he had attained before his entrance into this venerable establishment, then under the superindendance of Dr. Nichols, but it is certain that when he quitted it, at the age of eighteen, his scholastic acquirements were of the highest order.

After spending three months with his father at Berkhampstead, he was articled as clerk, for three years, to a Mr. Chapman, a solicitor, in London; it being the wish of his family that he should adopt the profession of the law. But legal studies possessed no attraction for the poetic and imaginative mind of Cowper, and instead of endeavouring to profit by the instruction he might have received, he passed the greater part of his time at the house of a near relation. This he playfully confesses in a letter written many years afterwards to Lady Hesketh, the daughter of this relative:—

"I did actually live three years with Mr. Chapman, that is to say, I slept three years in his house; but I lived, that is to say, I spent my days in Southampton Row, as you very well remember. There was I and the future Lord Chancellor (Lord Thurlow) constantly employed from morning to night in giggling and making giggle, instead of studying the law."

And in a more serious letter to his friend Mr. Rose, he makes the following just observations, to which we would earnestly call the attention of our young readers:—

"The colour of our whole life is generally such as the three or four first years in which we are our own masters make it. Then it is that we may be said to shape our own destiny, and to treasure up for ourselves a succession of future successes or disappointments."

Cowper's conduct at this time undoubtedly deserves our censure, for, had he seriously reflected on the subject, he must have been fully aware that it was extremely wrong thus to squander so large a portion of his precious time in idleness and unprofitable pursuits. Well would it have been for him had he remembered the wise advice of one of our poets—

XUM

"But soft, my friend—arrest the present moments,
For be assured they all are arrant tell-tales,
And though their flight be silent, and their path
Trackless, as the wing'd couriers of the air,
They post to Heaven, and there record thy folly;
Because, though station'd on th' important watch,
Thou, like a sleeping, faithless sentinel,
Didst let them pass unnoticed, unimproved."

The three years for which he was articled to the solicitor being expired, at the age of twenty-one Cowper took possession of a set of chambers in the Inner Temple. By this step he became, or rather ought to have become, a regular student of the law; but the higher branches of jurisprudence were as little capable of fixing his attention, as the elementary parts of that science. He now devoted his hours to poetry and literature, occasionally associating with such of his Westminster schoolfellows then resident in London as were distinguished for their literary talents. With the elder Colman, Bonnel Thornton, and Lloyd he was very intimate, assisting the two former in a periodical called the "Connoisseur," in which they were engaged, and writing numerous poems for Lloyd and other friends; so that the twelve years which he spent in the Temple were, if not passed entirely in literary pursuits, so much engrossed by them, as to add little or nothing to the small stock of legal knowledge which he had previously gained from the solicitor.

At the end of this period, there being no prospect of his deriving any income from his profession, and his patrimonial resources being nearly exhausted, our poet found himself not only unable to prosecute his favourite project of marrying, and enjoying domestic felicity, but in danger of suffering from actual want.

His friends probably entertained similar apprehensions, for several among them exerted themselves to procure for him the office of Reading Clerk to the House of Lords; but such was the exquisite sensitiveness of his disposition, that the idea of reading in public caused him feelings of apprehension, amounting even to torture. He begged and received permission to exchange the situation for a much less lucrative, but as he hoped less irksome one, then also vacant, namely, the Clerkship of the Journals of the House of Lords, which was supposed to require no attendance whatsoever.

An unlucky dispute in Parliament, however, made it necessary for him to appear before the Bar of the House and prove his ability for the situation. Accordingly he attended daily at the office to examine the journals, but his application was rendered useless, by that excess of diffidence which was inherent to his constitution.

"I read," he says, "without perception, and was so distressed, that, had every clerk in the office been my friend, it would have availed me little; for I was not in a condition to receive instruction, much less to elicit it out of manuscripts without direction."

His amiable and grateful disposition would not suffer him to resign the office, and thus cause the discretion of his benefactor to be called in question, for having nominated him to a place, the duties of which he was unqualified to perform. He determined to make the attempt; but, as the dreaded day approached, his terrors on the occasion rose to such a height, that they not only preyed upon his health, but completely overpowered his reason, and in a state of mental aberration he made several attempts upon his life.

His appearance at the Bar of the House was of course impossible, the

office was resigned, and he gradually became more calm; but as he did so a natural horror of his late design, of which he retained some recollection, overwhelmed him with the bitterest and most heart-rending remorse, which contributed greatly to bring on a return of his malady.

He thus affectingly describes his melancholy and truly pitiable state of mind at this time:—

"I never went into the street, but I thought the people stared and laughed at me, and held me in contempt; and I could hardly persuade myself but that the voice of my conscience was loud enough for everybody to hear it. Those who knew me seemed to avoid me; and if they spoke to me they seemed to do it in scorn. I bought a ballad of one who was singing it in the street, because I thought it was written on me. I dined alone, either at the tavern, where I went in the dark; or at the chop-house, where I always took care to hide myself in the darkest corner of the room. I slept generally an hour in the evening, though it was only to be terrified with dreams; and when I awoke it was some time before I could walk steadily through the passage into the dining-room; I staggered and reeled like a drunken man. The eyes of man I could not bear; but to think that the eyes of God were upon me, which I was assured of, gave me intolerable anguish."

It seems that he was now possessed with the idea that he had committed an unpardonable sin; and neither reason, nor religion, nor the arguments of his affectionate brother, could convince him to the contrary:—

"I had indeed," he writes, "a sense of Eternity impressed upon my mind, which almost amounted to a full comprehension of it. My brother, grieved to the heart with the sight of my misery, tried to comfort me; but all to no purpose. I refused comfort, and my sins appeared to me in such colours, that to administer it to me was only to exasperate me, and mock my fears."

After having experienced a temporary relief from the sensible and religious conversations of his friend Mr. Martin Madan, the dreadful malady, which had so long been hanging over him, assumed a more decided character, and he became really insane. He says:—

"A strange and horrible darkness fell upon me. If it were possible that a heavy blow could light upon the brain without touching the skull, such was the sensation I felt. I clapped my hand to my forehead, and cried aloud through the pain it gave me. At every stroke my thoughts and expressions became more wild and incoherent; all that remained to me, clear, was the sense of sin and the expectation of punishment. These thoughts kept undisturbed possession of my mind all the way through my illness, without interruption or abatement."

Cowper's brother and friends consulted together on his case, and agreed that he should be removed to St. Alban's, and placed under the care of the skilful and humane Dr. Cotton, who, besides being eminent as a physician, was a scholar and poet, and added to many accomplishments a peculiar sweetness of manners.

Here, after many months of extreme wretchedness, his reason in great measure returned, but it was unaccompanied by hope.

In about three months more, his brother, the Rev. John Cowper, came from Cambridge to visit him. Having heard from Dr. Cotton that the patient was much improved, his kind relative was grieved and disappointed to find him almost as silent and reserved as ever. This Cowper accounts for by saying, "The first sight of my brother struck me with many painful

sensations, both of sorrow for my own remediless condition, and envy of his happiness."

As soon as they were alone, his brother asked him how he found himself. Cowper replied, "As much better as despair can make me." But upon his brother's protesting to him that his present opinions were erroneous, and that he laboured under a delusion, Cowper burst into tears, and cried out, "If it is a delusion, then I am the happiest of beings!"

The brothers dined together, and Cowper passed the afternoon more cheerfully. That night he was refreshed with calm and tranquil sleep, and arose the next morning in much better spirits.

He now became capable of seeking and receiving consolation from prayer, and the study of the Holy Scriptures.

A few days before his arrival at St. Alban's he had, in a fit of religious despondency, thrown aside the Bible, as a book in which, owing to his unworthiness, he could no longer have any interest or concern:—

"The only instance," he says, "in which I can recollect reading a single chapter, was about two months before my recovery. Having found a Bible upon the bench in the garden, I opened it at the eleventh chapter of St. John, where Lazarus is raised from the dead; and saw so much benevolence, mercy, goodness, and sympathy with miserable man in our Saviour's conduct, that I almost shed tears, even after the relation, little thinking that it was an exact type of the mercy that Jesus Christ was on the point of extending towards myself. I sighed and said, 'Oh, that I had not rejected so good a Redeemer, that I had not forfeited all his favour!' Thus," he continues, "was my heart softened, though not yet enlightened. I closed the book without intending to open it again. Having risen with something of a more cheerful feeling, I repaired to the room where breakfast was waiting for me. I was continually more and more persuaded that I was not utterly doomed to destruction. The way of salvation, however, was still hid from my eyes."

At length his despair was, for the time, effectually removed, by the perusal of some of those consoling passages in the Word of God, which speak of the full, perfect, and sufficient sacrifice made by our blessed Saviour, on the cross, for the sins of the whole world.

We give his account in his own words:—

"The happy period which was to shake off my fetters, and afford me a clear opening of the free mercy of God in Christ Jesus, was now arrived. I flung myself into a chair near the window, and seeing a Bible there, ventured once more to apply to it for comfort and instruction. The first verse I saw was the twenty-fifth of the third chapter of Romans—'Whom God hath set forth to be a propitiation through faith in his blood, to declare his righteousness for the remission of sins that are past; through the forbearance of God.' * * * * I saw," continues Cowper, "the sufficiency of the atonement made by the Sun of Righteousness—my pardon sealed in his blood, and all the fulness and completeness of his justification."

In the summer of 1765 Cowper quitted St. Alban's, and took lodgings in the town of Huntingdon, where he made acquaintance with the family of the Rev. Mr. Unwin. His friendship, which was productive of the most important benefits to our poet, was commenced accidentally. William Unwin, the son of this clergyman, first observed Cowper in church, and struck by his uncommonly interesting countenance and manners, on the conclusion of the service followed him to a lonely walk, and then entered

into conversation with him. In a short time, so great was the pleasure the solitary poet took in the society of his newly-acquired friends, that he left his own lodgings to reside entirely at their house, where he was treated with the tenderest kindness and sympathy, and where he at last regained that happiness and peace of mind to which he had so long been a stranger.

Cowper's mode of life at this period more resembled that of a penitentiary friar, than of a Protestant layman.

He himself describes it in these terms:—

"We breakfast commonly between eight and nine; till eleven, we read either the Scriptures, or the sermons of some faithful preacher of those holy mysteries; at eleven we attend Divine Service, which is performed here twice every day; and from twelve to three we separate, and amuse ourselves as we please. During that interval, I either read in my own apartment, or walk, or ride, or work in the garden. We seldom sit an hour after dinner, but, if the weather permits, adjourn to the garden, where, with Mrs. Unwin and her son, I have generally the pleasure of religious conversation till tea-time. If it rains, or is too windy for walking, we either converse within doors, or sing some hymns of Martin's collection, and by the help of Mrs. Unwin's harpsichord make up a tolerable concert, in which our hearts, I hope, are the best and most musical performers. After tea we sally forth to walk in good earnest. Mrs. Unwin is a good walker, and we have generally travelled about four miles before we see home again. When the days are short we make this excursion in the former part of the day, between church time and dinner. At night we read and converse as before, till supper, and commonly finish the evening either with hymns or a sermon; and, last of all, the family are called to prayers."

The first interruption to his happiness was the death of Mr. Unwin, who was killed by a fall from his horse, about two years after Cowper came to reside with the family. After this melancholy event he retired with the widow to the village of Olney, in Buckinghamshire. Here he continued in the same pious and sequestered habits of life which he had adopted since his recovery, till the year 1772, when a second and more protracted visitation of the dreadful malady with which he had previously been afflicted, obscured his reason for the period of eight years, during which he was attended by Mrs. Unwin with a constant and anxious affection, which it was the great study of his after-life to repay.

In 1780 he began gradually to recover; and one of the first objects that engaged his attention was the taming and education of the three young hares, which he afterwards celebrated in verse: and, very soon after, his kind companion prevailed upon him to prepare some moral pieces for publication, in the hope that the writing them might prove a salutary occupation to his mind. Accordingly, at the age of fifty, and at a distance from all the excitement that emulation and ambition usually hold out to a poet, we find Cowper beginning to write.

His literary pursuits had a very beneficial effect upon Cowper, as appears from his own account, in a letter written to his cousin, where he says:

"Dejection of spirits, which I suppose may have prevented many from becoming an author, made me one. I find constant employment necessary, and therefore take care to be constantly employed. Manual occupations do not engage the mind sufficiently, as I know by experience, having tried many. But composition, especially of verse, absorbs it wholly. I write therefore generally three hours in a morning, and in an evening I transcribe. I read also, but less than I write."

In another letter he observes:—

"My sole drift is to be useful; a point which, however, I know I should in vain aim at, unless I could be likewise entertaining. I have, therefore, fixed these two strings upon my bow, and by the help of both have done my best to send my arrow to the mark."

In another passage, speaking on the subject of his writings, he says:—

"My labours are principally the production of last winter; all, indeed, except a few of the minor pieces. When I can find no other occupation, I think; and when I think, I am very apt to do it in rhyme. Hence it comes to pass, that the season of the year which generally pinches off the flowers of poetry, unfolds mine, such as they are, and crowns me with a winter garland. In this respect, therefore, I and my contemporary bards are by no means upon a par. They write when the delightful influences of fine weather, fine prospects, and a brisk motion of the animal spirits, make poetry almost the language of nature; and I, when icicles depend from all the leaves of the Parnassian laurel, and when a reasonable man would as little expect to succeed in verse as to hear a blackbird whistle. This must be my apology to you, for whatever want of fire and animation you may observe in what you will shortly have the perusal of. As to the public, if they like me not, there is no remedy."

His first volume of poetry, which appeared in the year 1781, was not well calculated for becoming popular, and was but little read until the increasing fame of its author brought all his works into notice.

In the latter part of this year, Cowper formed an accidental acquaintance with the widow of Sir Thomas Austen, which in spite of his excessive shyness gradually ripened into a warm and mutual friendship. Many of his most celebrated productions were written in consequence of the suggestions of this lady. Whenever she saw him unusually melancholy, she would endeavour to amuse him by her lively and entertaining conversation.

(*To be continued.*)

GUANO.

Guano, or Huano (the Peruvian name for manure), a substance used as a manure, found on certain small islands off the coast of Peru and Bolivia, and on parts of the shore of the main land. It is friable and easily reduced to powder; its colour varies from a dull red to a dirty white, and it has a strong smell, and a fat, unctuous feel. At an average it weighs from fifty to sixty pounds a bushel. Humboldt was the first, or one of the first, by whom this important substance was brought to Europe; but it was described at a much earlier date by Ulloa, and has been used as a manure by the Peruvians from the time of the Incas, downwards. Different opinions have been entertained of its origin. Many have supposed it a peculiar mineral or earth; but Ulloa is clearly of opinion that it consists of the excrements of the sea birds which are found in prodigious numbers on the coast of Peru. The localities where it is deposited being a rainless region, it is accumulated with a rapidity of which we have no idea. Guano is of very different qualities: some prefer the whitish (supposed to be more recent deposit), others prefer the red. The best is that which contains the greatest quantity of ammoniacal salts. A quantity represented by 100 parts, examined by Klaproth, yielded 16 parts of urate of ammonia,

10 of phosphate of lime, 12¾ of oxalate of lime, 4 of silica, ½ of common salt, 28 of sand, and 28¾ of water and organic combustible matter.

Guano has only been recently introduced into England; and there is much discrepancy in the statements that have been put forth as to its operation. There can be no doubt that it is a most efficient manure; and that from two to two and a-half cwt. per acre of average guano, mixed with about two-thirds of the usual quantity of farmyard manure, will produce, when applied to well-drained land, nearly double the ordinary quantity of potatoes. It produces splendid crops of turnips, by its own agency only—and has a powerful influence in improving crops of corn. The effect is said to be materially increased by its being covered up to some considerable depth as soon as it is laid upon the soil; and top-dressing is a wasteful way of applying the manure. Since it began to be imported into Europe, an apprehension began to gain ground that the stock might be exhausted, and thus the estates along the coast of Peru, which are cultivated only by its means, might be ruined. The fear however is ascertained to be groundless. At present the guano is principally obtained from some small islands opposite Pisco. The English consul, Mr. Wilson, states that although 300 tons a year have been for centuries exported from Chincha, one of the small islands in question, there are estimated to be on that same island not less than seventeen million tons, and that the supply in the various islands, in the group just alluded to, may be safely estimated at above forty million tons. But exclusive of these islands there are others, as well as the main land, on which guano has been found, that even supposing the quantity just mentioned is an exaggeration, yet for all practical purposes the stock may be deemed inexhaustible.

The quantity of guano imported in the year 1850, amounted to 116,925 tons, of which 95,083 tons came from Peru.

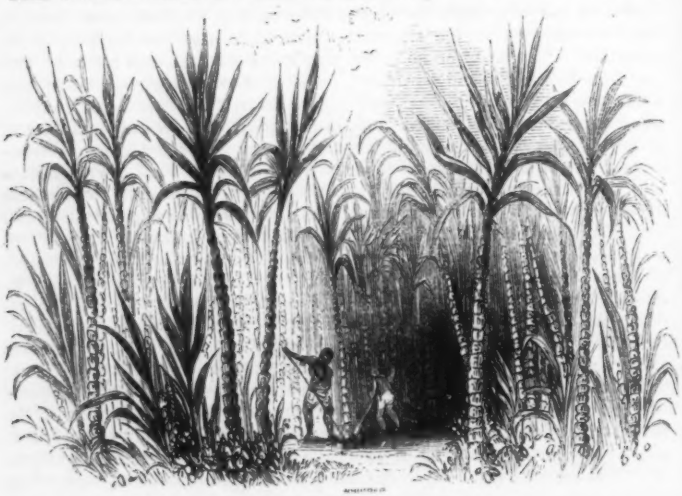
In the year 1845, 283,300 tons were imported from various parts of the world, the Western Coast of Africa supplying 207,679 tons, and 14,101 tons from Peru. The inferior nature of the guano from Africa, is shown from the fact that only 2,953 tons were imported into England in the year 1850.

Many agriculturists believe that, with guano at five pounds per ton, all the difficulties consequent upon the repeal of the Corn Laws would disappear; it is therefore much wished that the Government would either get the present heavy duty upon guano reduced, or would purchase some islands from the Peruvian Government.

The quantity imported from Peru increases rapidly yearly, as we may see from the table below:—

1846	1847	1848	1849	1850
Tons.	Tons.	Tons.	Tons.	Tons.
25,102	59,430	64,191	73,567	96,295

M'Culloch.



SUGAR PLANTATION.

THE MANUFACTURE OF SUGAR IN THE WEST INDIES.

ALTHOUGH the manufacture of sugar in this country consists chiefly in the production of a fine crystalline substance from a raw material, yet no account of sugar can be deemed complete without some account of the plant itself, its cultivation, and the processes adopted, in the countries where it flourishes, for extracting and preserving its juice.

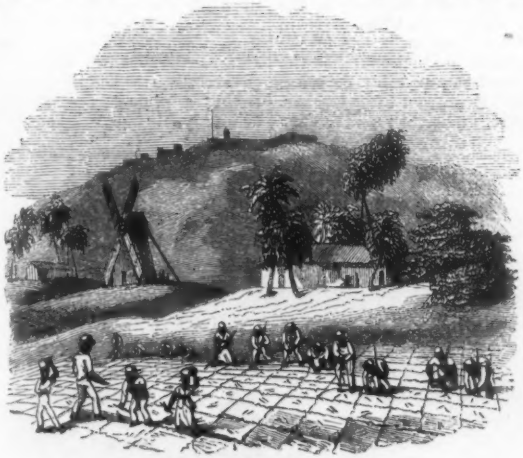
The sugar-cane (*Saccharum officinarum*) is a jointed reed, varying in height according to the species, the character of the soil, and the mode of culture, from threeand a half to seven feet, and sometimes from twelve to twenty feet. When ripe, it is of a fine straw colour, producing leaves or blades, the edges of which are firmly and sharply serrated, and terminating in an arrow decorated with a panicle. The joints in one stalk vary in number from forty to sixty (and even eighty in the Brazil cane), and the stalks rising from one root are sometimes very numerous. Every joint is furnished with a bud which encloses the germ of a new cane. The young shoot ascends from the earth like the point of an arrow; the shaft of which soon breaks, and the first two leaves rise to a considerable height.

The outer part of the cane is hard and brittle, but the inner consists of a soft pith containing the sweet juice, which at first has all the characteristics of unripe mucous fruits; it afterwards resembles, both in taste and smell, the juice of sweet apples; it gradually loses this, and takes the smell and taste peculiar to the cane.

The torrid zone is most favourable to the growth of the sugar-cane, but it may be cultivated as high as the fortieth degree of latitude. It will not flourish in a merely sandy soil: the best soil is the ashy loam of St. Christopher's or a mixture of clay and sand, called *brick mould*. Due attention to manuring is of the utmost importance to the success of the cane.

The sugar-cane is propagated by cuttings, which multiply surprisingly. The slips for planting generally include two or three upper joints of the cane, stripped of leaves. These are planted in holes from fifteen to eighteen inches square, and from eight to twelve

inches deep, at distances about two feet apart, and in rows three feet apart, spaces being left here and there, for the convenience of carting. Each hole is banked up round its margin with the earth thrown up by the hoe, and manure is put into it. Two or more cuttings are then placed lengthwise in each hole, and are lightly covered up. In about a fortnight the young sprouts appear: some of the earth heaped up round the hole is then put in, and as the plant grows the remainder is gradually added. The young plants are carefully hoed, and all weeds removed. Offshoots are likewise cut away, because they draw off nourishment from the plants.



PLANTING THE SUGAR-CANE

The canes which grow immediately from the planted slips are called *plant-canes*; but it is customary, in the West Indies, to raise several crops from the old roots, or *stoles*, as they are called; and the sprouts from these stoles are named *rattoons*, a corruption of the French word *rejetons* (sprouts).

The above method is subject to many variations, according to circumstances, among which may be mentioned the following:—The slips which are planted in August and September are managed as before till January, when the young plants are cut close to the ground, and the remainder of the mould is spread over the roots, which soon afterwards send forth a number of vigorous shoots of equal growth. By this method the canes are not too rank in the rainy season, while they come to perfection in good time in the succeeding spring.

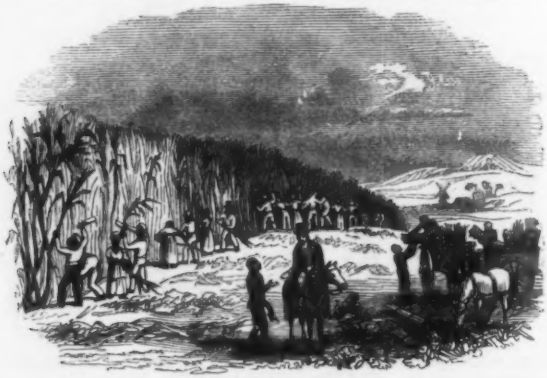
The best season for planting is between August and November, and the cane varies from ten to twenty months in arriving at maturity. If the soil be favourable, the canes planted at proper distances from each other, and the land carefully managed, the same plant may continue above twenty years without replanting; but in the common method the lands are sometimes replanted every six or seven years, and in poor soils every two or three.

But in spite of all the care of the planter, the sugar-cane is liable to many diseases. The most formidable is called *blast*. It is produced by myriads of little insects, invisible to the naked eye, which feed upon the juice of the cane, in search of which they wound and destroy the vessels. Hence, the circulation being injured, the growth is checked, and it withers or dies. In some of the Windward Islands a kind of grub, called the *borer*, in dry weather, commits great ravages on the cane. Rats and ants do some mischief, but the latter are more annoying than destructive.

About the month of March or April the cane has attained maturity, as indicated by the skin becoming smooth, dry, and brittle; by the heaviness of the cane, and the juice being sweet and glutinous.

The following description of a field of sugar-canes, at two periods of its growth, is by an eye-witness:—

"A field of canes, standing in the month of November, when it is in arrow, or full blossom, is one of the most beautiful productions that the pen or pencil can possibly describe. It commonly rises from three to eight feet, or more, in height; a difference of growth that very strongly marks the difference of soil, or the varieties of culture. It is, when ripe, of a bright and golden yellow, and, where exposed to the sun, is in many parts very beautifully streaked with red; the top is of a darkish green, but as it becomes more dry, from either an excess of ripeness or a continuance of drought, it is of a russet yellow, with long and narrow leaves depending, from the centre of which shoots up an arrow like a silver wand, from two to six feet in height, the summit having a plume of white feathers, delicately fringed with lilac."



THE CANE HARVEST.

In gathering in the canes, they are cut as near the ground as possible, as the lower joints contain the richest juice. One or two of the top joints, in which the juice is not sufficiently matured, are rejected; the remainder are cut into pieces about a yard long, tied into bundles, and conveyed immediately to the mill; for, if allowed to remain long, they would ferment and spoil.

As soon as the canes have arrived at the mill they are crushed between rollers, by which means all the juice is expelled. The rollers are hollow cylinders of cast iron, turned with the greatest care, and fluted with grooves of small depth. They are three in number, and measure from thirty to forty inches in length, and from twenty to twenty-five inches in diameter. They may be arranged either vertically or horizontally, and the middle roller, to which the moving power is applied, turns the other two by means of cogs. The canes are twice compressed between these rollers; for, having passed through the first and second, they are turned round the middle one by a circular screen, called the *dumb returner*, and forced back through the second and third, an operation which squeezes them completely dry. The cane-juice is received in a leaden bed, and thence conveyed to the boiling-house. The rind of the cane, called *cane-trash*, serves for fuel to boil the juice; and it is also valuable as manure.

The fresh juice is thick, and gummy; of a dull grey, olive, or olive-green colour, and of a sweet balmy taste. It contains numerous solid particles of the cane, most of which

can be separated by filtering or by settling. The juice is so fermentable, that in the climate of the West Indies, it would begin to turn acid within twenty minutes after leaving the mill, unless promptly boiled, and the sugar separated.*

The juice is quickly conveyed into large flat-bottomed coppers, or open pans, called *clarifiers*, which commonly contain from 300 to 400 gallons each. A fire is placed under each vessel, and a siphon, or stop-cock, is supplied for drawing off the liquor. When the clarifier is filled with juice, a small quantity of lime, called *temper*, is added, the object of which seems to be to correct acidity, and also, by rendering the solid impurities insoluble, to cause them to be thrown up into the scum. As the liquor becomes hot, this scum rises to the surface, and shortly before the boiling point is attained it forms blisters, and breaks into white froth. The fire is then extinguished, and the liquor allowed to repose during one hour, when it is carefully drawn off without disturbing the scum, which sinks unbroken, and is removed from the clarifier before another charge of juice is added. In this process, if the juice were allowed to boil, the scum would be broken up, and reabsorbed by the liquor.

Boiling-House.

The clarified juice, which is of a clear bright yellow wine colour, is next removed to the largest of a series of evaporating pans, which are placed over a large stove heated by a fire at one end. Here the juice is suffered to boil, and the scum, as it rises, is carefully removed, lime-water being occasionally added if the juice is not clear. When sufficiently reduced in bulk by evaporation to be contained in the second or middle-sized pan, the juice is transferred, and the boiling and scumming repeated until it is sufficiently reduced to be contained in the third or smallest pan, called the *teache*. In this vessel it is boiled down to a thick syrup, which, on cooling, will *granulate*, or separate into grains of sugar. The required consistency is ascertained by taking a small portion of the syrup upon the

* The juice, as it flows from the mill, contains, on an average, eight parts of pure water, one part of sugar, and one part of coarse oil and mucilage, with a portion of essential oil. The object of the subsequent operations is to separate this one part of sugar. In St. Vincent one pound of sugar is obtained from each wine-gallon of the best cane-juice; twenty gallons of juice, of middling quality, afford only sixteen pounds of sugar; and when the juice is watery, twenty-four gallons are required to produce the same quantity of sugar. Peligot says that out of every ten parts of juice nearly two parts are sugar, and that if more scientific methods of separating the sugar were adopted, little or no treacle would be produced

thumb, then bringing the fore-finger in contact with it, and again separating them, noting the length to which a thread of syrup can be drawn before it breaks: if this extends to about half an inch in length, the sugar is judged to be fully boiled. This trial by the *touch* is supposed to give the name of *teache* to the last evaporating pan.

The syrup is next ladled or *skipped* into shallow wooden boxes, called *coolers*, each capable of containing about a hogshead of sugar. There the sugar soon *grains*; that is, it forms into a soft mass of crystals imbedded in molasses, which are the uncrystallizable part of the sugar. The molasses are separated in the *curing-house*, to which the soft sugar is next removed. This is a large building, the lower part of which is lined with lead, and forms the molasses reservoir. Over this, on an open framing of joists, are placed the sugar-hogsheads, called *potting-casks*. In the bottom of each cask are bored several holes, an inch in diameter, into each of which is placed either a plantain stalk or a crushed cane of sufficient length to reach the top of the hogshead. The soft sugar is then removed to these casks, and the molasses gradually drain away through the spongy stalks or canes, leaving the crystalline portion tolerably dry. In about three weeks it is fit for shipment. A further drainage of molasses takes place subsequent to shipment, amounting, it is said, to no less than 12 per cent.

Such is the *raw*, *brown*, or *muscovado* sugar of the West Indies, which is used for domestic purposes, and also by sugar-refiners in making *white* or *loaf* sugar. But there is another kind, very common on the continent, called *Clayed* or *Lisbon* sugar, the produce of the Island of Cuba, the Brazils, and other places. The cane-juice is prepared much in the same way as in the West Indies, until it arrives at the coolers, when, instead of being transferred to hogsheads, it is placed in conical earthen moulds, called *formes*, or *pots*, each of which has a small hole at the point. These holes being plugged up, the moulds are placed, with the point downwards, into earthen jars. The moulds are then filled with syrup, and allowed to repose during fifteen or twenty hours. The plugs are next taken out, and the uncrystallized syrup allowed to flow out. The sugar is then pressed down, and the space filled up with powdered white sugar; this being also well pressed down, a quantity of *clay*, mixed with water, is placed upon the sugar, and the moulds are removed to empty pots. The moisture from the clay, filtering slowly through the sugar, carries away the colouring matter and the remaining portions of the uncrystallized syrup. The clay having parted with its moisture is taken off, and renewed several times during about twenty days, when the process is complete. The loaves are then taken out of the moulds, dried gradually in a stove, and afterwards each loaf is divided into three portions; the base of the cone being white, the middle yellow, and the small part brown; these are crushed into coarse powders and packed separately in hogsheads.

READY MONEY.

It makes a great difference to comforts and character, whether a man buys his goods at the shop as he wants them, and then pays for them on the Saturday night; or, whether he carries the money in his hand when he purchases the goods. In one case, he will always have the feeling of being in easy circumstances; in the other, he will always feel that he is a poor man; yet, in both cases he will have the same income, and spend the same, except that, when he has the ready money, he can go to what shop he pleases, and so make his money go much further; and the shop-keeper, too, is much more glad to see him, and thinks better of him. Now, all this difference is made by just contriving to have one week's pay forward, instead of backward; to live, not one week under another, but one week over another.